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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,693	01/24/2002	Takumi Mikawa	740819-731	7849

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EXAMINER

WILSON, SCOTT R

ART UNIT PAPER NUMBER

2826

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/053,693

Applicant(s)

MIKAWA ET AL.

Examiner

Scott R. Wilson

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 10-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 1-9 in Paper No. 5 is acknowledged.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: SEMICONDUCTOR MEMORY WITH HYDROGEN BARRIER.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Nakura. Nakura, Figure 1, discloses a semiconductor memory device comprising a semiconductor substrate (21), a memory cell capacitor (14) for storing data, including a first electrode (24) provided above the semiconductor substrate, a capacitance insulating film (26) formed on the first electrode, and a second electrode (28) provided on the capacitance insulating film. Nakura, Figure 1, further discloses a step reducing film (30) covering an upper surface and a side surface of the memory cell capacitor, and an overlying hydrogen barrier film (32) covering the step reducing film.

As to claim 2, Nakura discloses the step reducing film (30) to be formed by an atmospheric pressure thermal CVD method using O₃ and TEOS (col. 5, lines 46-47).

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As to claim 3, Nakura discloses prior art in which the overlying hydrogen barrier film is formed by a sputtering method (col. 2, line 3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakura in view of Bailey. Nakura, Figure 1, discloses the invention of claim 1, as described above. Nakura does not disclose expressly an underlying hydrogen barrier film provided under the first electrode. Bailey, Figure 7B, discloses a semiconductor memory device comprising a memory cell capacitor (876, 878, 880) with an overlying hydrogen barrier film (886) and an underlying hydrogen barrier film (874) provided under the bottom electrode (876), which would correspond to applicants first electrode. At the time of invention, it would have been obvious to a person of ordinary skill in the art to form an underlying hydrogen barrier under the first electrode. The motivation for doing so would have been the complete encapsulation of the memory cell capacitor (col. 8, lines 6-10) to block hydrogen induced degradation of the capacitor (col. 1, lines 29-30). Therefore, it would have been obvious to combine Bailey with Nakura to obtain the invention as specified in claim 4.

As to claim 5, Bailey, Figure 7B, discloses the underlying hydrogen barrier film to be in contact with the overlying hydrogen barrier film in a peripheral region around the memory cell capacitor, at the intersection of layers (886) and (874).

As to claim 6, the overlying hydrogen barrier film (886) and the underlying hydrogen barrier film (874) are patterned so as to have substantially the same outer shape. The outer shape is largely planar and both films have about the same dimension in a direction parallel to the substrate.

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As to claim 7, Nakura, Figure 1, discloses that the hydrogen barrier film (32), which would correspond to the overlying hydrogen barrier film (886) in the embodiment of Bailey, covers the upper surface of the step reducing film (30) and has a side wall, corresponding to the sloped region between electrode metallizations (42) and (40), which covers a side surface of the step reducing film.

As to claim 8, Bailey, Figure 10B, discloses the first electrode, which may be embodied by the combination of the conductive layers (1178) and (1176), partially buried in the underlying hydrogen barrier film (1174).

As to claim 9, Bailey, Figure 10B, discloses the first electrode to include a conductive hydrogen barrier film (1176) in a lower portion thereof.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott R. Wilson whose telephone number is 703-308-6557. The examiner can normally be reached on M-F 8:30 - 4:30 Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 703-308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.

srw
July 7, 2003

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800